IN THE CLAIMS

Please amend the claims as follows:

1. (Withdrawn-Currently Amended) A monolithic semiconductor optical device comprising:

a common semiconductor substrate configured to have an electric absorption modulator formation area and a DFB laser formation area;

an electric absorption modulator (EA modulator) formed in the electric absorption modulator formation area and having an aluminum-based EA modulator active region not ~~having~~ being included as part of a mesa stripe configuration; and

a distributed feedback laser device (DFB laser) formed in the DFB laser formation area and having a non-aluminum-based DFB laser active region ~~having~~ being included as part of a mesa stripe configuration.

2. (Withdrawn) The monolithic semiconductor optical device according to claim 1, wherein:

the EA modulator active region is configured to be quantum wells and comprises an A1GaInAs-based material.

3. (Withdrawn) The monolithic semiconductor optical device according to claim 2, wherein:

the EA modulator active region is configured to be at least a couple of an SCH (Separate Confinement Heterostructure) and comprises an A1GaInAs-based material.

4. (Withdrawn) The monolithic semiconductor optical device according to claim 2, wherein:

the DFB laser active region is configured to be a quantum well and comprises a GaInAsP -based material.

5. (Withdrawn) The monolithic semiconductor optical device according to claim 1, wherein:

the EA modulator active region is configured to be wider than the DFB laser active region.

6. (Withdrawn) The monolithic semiconductor optical device according to claim 4, wherein the EA modulator comprises:

at least one of a buried ridge structure or a self aligned structure (SAS).

7. (Withdrawn-Currently Amended) The monolithic semiconductor optical device according to claim 6, wherein the EA modulator comprises:

an optical waveguide stripe layer comprising at least one of a GaInAsP or AlGaInAs layer in an upper cladding layer ~~having a mesa stripe configuration~~.

8. (Withdrawn) The monolithic semiconductor optical device according to claim 6, wherein the EA modulator comprises:

A1GaInAs layer configured as an SCH-MQW and as an etchant stop.

9. (Withdrawn) The monolithic semiconductor optical device according to claim 1, wherein:

the DFB laser comprises a semi-insulating buried heterostructure GaInAsP -based DFB laser; and

the EA modulator comprises a buried ridge type AlGaInAs-based EA modulator.

10. (Withdrawn) The monolithic semiconductor optical device according to claim 1, wherein:

the DFB laser comprises a semi-insulating planar buried heterostructure GaInAsP - based DFB laser; and

the EA modulator comprises a self aligned structure (SAS) AlGaInAs-based EA modulator.

11. (Withdrawn) A monolithic semiconductor optical device comprising:

a common substrate having an electric absorption modulator formation area and a DFB laser formation area;

an A1GaInAs-based quantum well electric absorption modulator (EA modulator) formed in the electric absorption modulator formation area;

a quantum well structure distributed feedback laser device (DFB laser) formed in the DFB laser formation area;

means for generating a coherent light; and

means for modulating the coherent light at a modulation rate greater than 10 GHz.

12. (Currently Amended) A method for fabricating a monolithic semiconductor optical device comprising steps of:

providing a common substrate having a modulator formation area and a laser formation area; and

forming on the common substrate a multilayer structure that is at least a portion of a DFB laser including a non-aluminum based active region ~~having~~ being included as a part of a mesa stripe configuration; and

forming on the common substrate a multilayer structure that is at least a portion of an EA modulator including an aluminum based active region not ~~having~~ being included as a part of a mesa stripe configuration.

13. (Currently Amended) The method as defined in claim 12, ~~wherein said forming step comprises substeps of~~ further comprising:

forming ~~one of the EA modulator and~~ the multilayer structure that is at least a portion of a DFB laser ~~steps~~ across the common substrate to form a first stacked structure;

etching the first stacked structure, wherein said etching step is configured to create a second stacked structure and to expose a portion of the substrate, wherein the portion of the substrate corresponds to the modulator formation area;

forming on the exposed portion of the substrate the ~~other of the DFB laser and the~~ multilayer structure that is at least a portion of an EA modulator, wherein said forming on ~~a~~ the exposed portion of the substrate is configured to form a third stacked structure including the aluminum-based active region; and

forming a mesa stripe by simultaneously etching the second stacked structure and third stacked structure said etching of the third stacked structure not extending into the aluminum-based active region.

14. (Original) The method as defined in claim 13, wherein the step of forming a mesa stripe comprises:

a substep of dry etching.

15. (Original) The method as defined in claim 14, wherein said substep of dry etching comprises a substep of:

etching with one of a methane-based and a bromine-containing etchant in a chamber of a film-forming apparatus.

16. (Original) The method as defined in claim 12, further comprising a step of:

burying the mesa stripe with at least one semi-insulating InP layer, wherein said burying step is configured to form a BH structure in the DFB laser formation area and at least one of a buried ridge structure and an SAS structure in the EA modulator formation area.

17. (Currently Amended) A method for fabricating a monolithic semiconductor optical device comprising steps of:

providing a common substrate having a modulator formation area and a laser formation area;

forming a multilayer structure of a DFB laser on the common substrate in said laser formation area;

forming a multilayer structure of an EA modulator on the common substrate in said modulator formation area; and

forming a mesa stripe by simultaneously etching said laser formation area and said modulator formation area in such a way that the multilayer structure of a DFB laser is selectively etched to a deeper depth than that for the multilayer structure of an EA modulator.

18. (New) The method as defined in claim 12, further comprising:

forming the multilayer structure of an EA modulator across the common substrate to form a first stacked structure having an aluminum based active region;

etching the first stacked structure, wherein said etching step is configured to create a second stacked structure and to expose a portion of the substrate, wherein the portion of the substrate corresponds to the DFB laser formation area;

forming on the exposed portion of the substrate the multilayer structure of a DFB laser, wherein said forming on the exposed portion of the substrate is configured to form a third stacked structure including a non-aluminum based active region; and

forming a mesa stripe by simultaneously etching the second stacked structure and the third stacked structure said etching of the second stacked structure not extending into the aluminum based active region.